Cold, Magnetically-Trapped Br Atoms

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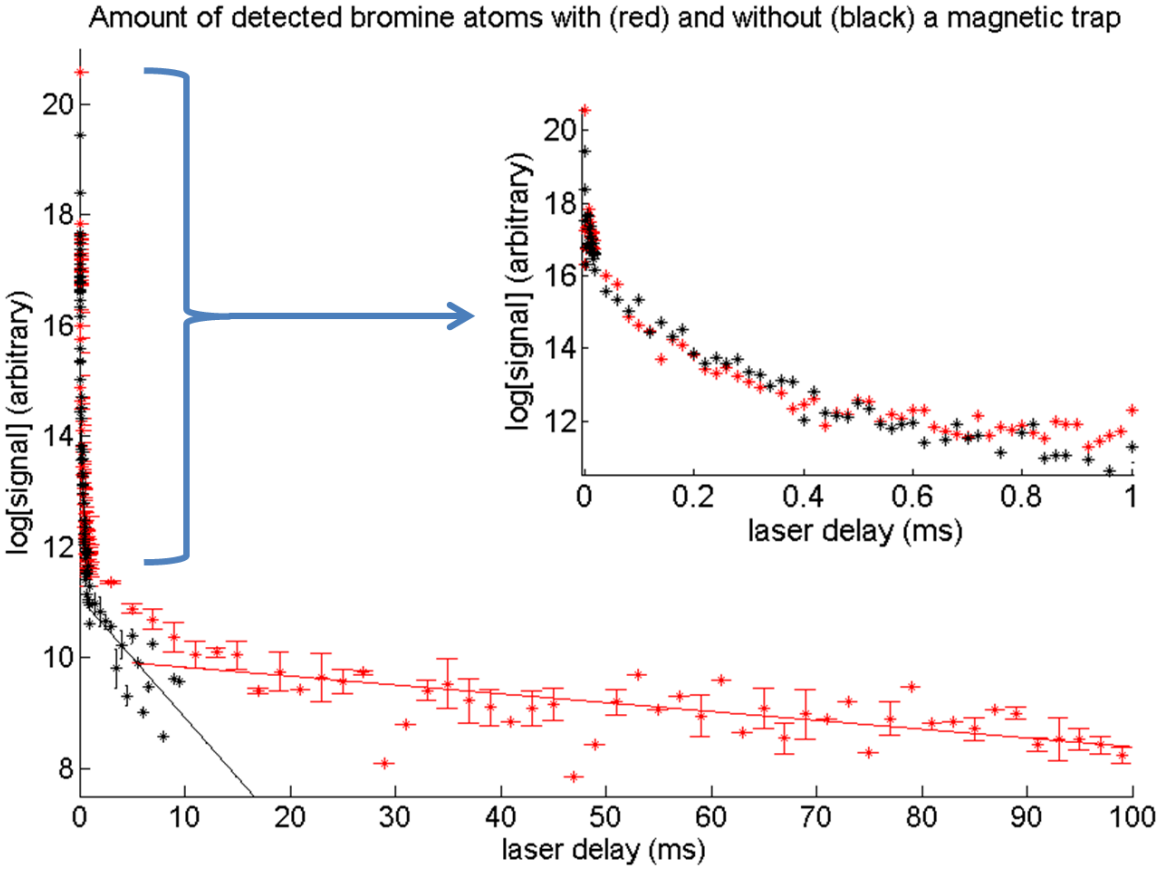
We have produced a source for cold Br atoms in a magnetic trap. The Br atoms are produced by photodissociation of molecular bromine at 460 nm. The excess energy above the dissociation threshold produces Br fragments that recoil along the polarization axis of the laser. These Br fragments have velocity vectors that cancel that of the molecular bromine and are thus stationary in the lab frame. A pair of magnets forms a quadrupole-like potential which trap the Br atoms with low-field seeking states. The trapped Br atoms are then detected by 2+1 multiphoton-ionization at 255 nm delayed from the dissociation laser. We have detected these Br atoms at delays of 99 ms up to the next laser shot (figure below), allowing for the potential to build up the density of these trapped Br atoms over successive laser shots. A molecular dynamics model has shown that this density can reach steady-state after a few seconds, despite elastic collisions with the molecular bromine and background gas.



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